



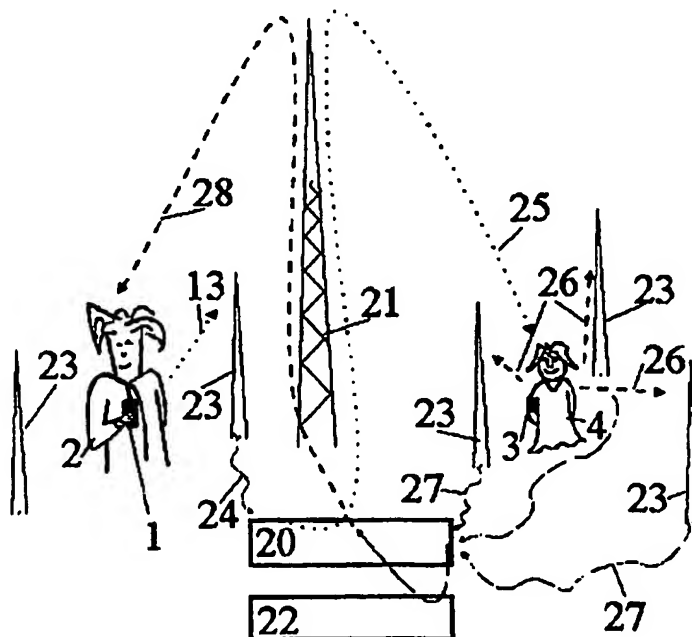
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : G01S 5/14, 13/87	A1	(11) International Publication Number: WO 99/49331 (43) International Publication Date: 30 September 1999 (30.09.99)
<p>(21) International Application Number: PCT/IB99/00713</p> <p>(22) International Filing Date: 18 March 1999 (18.03.99)</p> <p>(30) Priority Data: 1008662 20 March 1998 (20.03.98) NL</p> <p>(71) Applicant: KONINKLIJKE KPN N.V. [NL/NL]; Stationsplein 7, NL-9726 AE Groningen (NL).</p> <p>(72) Inventors: BLOK, Django; J.C. van Markenplein 2, NL-2613 AE Delft (NL). AASMAN, Jannes; P.O. Box 95321, NL-2509 CH The Hague (NL). FEIJEN, Maurice, Matthias; P.O. Box 95321, NL-2509 CH The Hague (NL).</p> <p>(74) Agent: KLEIN, Bart; Koninklijke KPN N.V., P.O. Box 95321, NL-2509 CH The Hague (NL).</p>	<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p>Published With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments. In English translation (filed in Dutch).</p>	

(54) Title: MOBILE LOCATING SYSTEM

(57) Abstract

Mobile locating system, particularly suitable for locating children, comprising at least one mobile search device, at least one mobile responder device, a communication network which enables at least communication from the search device to the responder device to activate the responder device from the search device, and a positioning system for generating positional signals relating to the position of the responder device, and passing on the positional signals to an exchange, provided with a geographical information system, of the communication network which is arranged to transmit positional information obtained from the positional signals by way of the communication network to the search device.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece			TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
CM	Cameroon			PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakhstan	RO	Romania		
CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

Mobile locating system.

The invention relates to a mobile locating system particularly suitable for locating children.

Locating systems are known in various embodiments. In PCT application WO 96/12264, e.g., there is described an object-locating system for locating objects such as, e.g., a vehicle. In this connection, the object is provided with an emergency transmitter which, if the object ends up in an abnormal situation, is capable of emitting an emergency signal which may be passed on to a central emergency station by way of a telecommunication network such as, e.g., the GSM network [GSM = Global System for Mobile communications]. Such a system, however, is not very suitable for locating children, since in most cases the emergency transmitter should still be activated by the child. A child, however, often does not know when it is being looked for by its parents, so that the parents will often try in vain to locate the child. Another drawback is the need of a central emergency station. In such a system, the parents who want to locate a child should first contact the emergency station and are not capable of directly verifying themselves where the child is.

In the U.S. patent specification 5,461,365, there is disclosed a personal emergency system which may also be used for monitoring children. Said known system also comprises a base station and a portable unit which may have an emergency button but which may also be arranged as a mobile phone. Said system results in similar drawbacks as the system disclosed in WO 96/12264.

Furthermore, there are known systems in which parent and child each have small portable transceivers which may communicate directly with one another if so desired. Such a system has only a limited range and in addition is not capable of clearly indicating where the transceiver of the child, and therefore the child itself, is located.

This is why there is a need for a simple, user-friendly yet effective system for locating children, which overcomes the above and other drawbacks of the various known systems. According to the invention, for this purpose a mobile locating system of the type described above is characterised by at least one mobile search device, at least one mobile responder device, a communication network which at least enables communication from the search device to the responder device for activating the responder device from the search device, and a positioning system for generating positional signals relating to the

position of the responder device and transmitting the positional signals to an exchange of the communication network provided with a geographic information system, which is arranged for transmitting to the search device the positional information obtained from the
5 positional signals by way of the communication network.

Below, the invention will be described in greater detail by reference to the enclosed drawing of an exemplary embodiment.

FIG. 1 schematically shows a first exemplary embodiment of a mobile locating system according to the invention;

10 FIG. 2 schematically shows a second exemplary embodiment of a mobile locating system according to the invention;

figures 3 to 5 inclusive schematically show, in the form of block diagrams, several exemplary embodiments of a locating system according to the invention;

15 FIG. 6 schematically shows an example of a mobile search system for use in a locating system according to the invention.

FIG. 1 shows a first exemplary embodiment of a locating system according to the invention. To start with, it should be noted that, although the locating system was originally designed for, and is also
20 described below with respect to, locating lost children or, e.g., locating children who, although they were not lost, are still located outside the field of vision of the parents or supervisors or the like, the locating system may also be applicable in other situations. There may be thought of, e.g., application to persons having health
25 problems, or the mentally disabled, but also of application for specific pets.

The locating system shown in FIG. 1 comprises at least one search device 1 for a parent or supervisor 2, at least one responder device 3 for a child 4, a communication network 5 and a positioning
30 system 6.

If a parent 2 desires to know where the child 4 is, the parent activates the mobile search system 1. Such a device may have approximately the size of a mobile phone, and is provided with several control buttons and a display screen, e.g., an LCD screen [LCD =
35 Liquid-crystal Display] on which control information and also information received on the location of the responder device may be shown.

The search device is arranged to transmit, after activation, a

search signal which is picked up by any of the receiver antennae 7 of the communication network 5, and is broadcast by way of an exchange 8 of the communication network 5 and a transmitter antenna 9 connected thereto, as schematically indicated by arrows 10, 11. The search
5 signal should contain a predetermined code which may be recognised by the responder device of the sought child, so that only said responder device reacts to the search signal. Apart from wireless connections, the network 5 may also contain fixed lines which may extend between, e.g., the exchange and the antennae, or between the exchange and
10 possible sub-exchanges. The communication network may be an existing network for mobile telephony such as, e.g., the GSM network. A drawback of the existing network for mobile telephony is that it involves a sometimes extensive time for setting up the connection. Said drawback does not apply to a mobile data network such as, e.g.,
15 the RAM [= random access memory] mobile data network.

The responder device 3 is arranged to react to the search signal of the associated search device 1. After receiving a correctly encoded search signal, the responder device activates a receiver for positional signals built into the responder device. The latter may be
20 signals 13 transmitted, by way of satellites 12, by the existing GPS system (GPS = Global Positioning System). The responder device transmits to the exchange 8 the positional signals received by way of an antenna 7 of the communication network, as schematically indicated by arrows 14, 15. The exchange 8 is provided with a geographic
25 information system 16 which determines the location of the responder device from the positional signals 16. Said location is then transmitted back, by way of the exchange 8 and the antenna 9, to the search device 1, as schematically shown by an arrow 17. The search device may be arranged to receive and process positional signals, so
30 that in the search device it may be determined, from the difference between the position of the parent and the position of the child, in which direction and at which distance from the search device the sought child is.

As an alternative, the latter may be determined in the exchange,
35 which is then capable of transmitting the information in question to the search device.

As an alternative to the GPS system, for positioning there may also be made use of another navigational network, e.g., an earthbound

5 navigational network having a number of radio beacons. The radius of such a network is geographically limited to a specific area, e.g., an amusement park, or a nature reserve or the Dutch territory. Such an earthbound navigational network may be more accurate than the GPS system. With only five radio beacons distributed throughout the Netherlands, there may already be obtained an accuracy of 10 metres. The responder device may transmit the positional signals received from the radio beacons by way of the GSM network to a central transmitter provided with a GIS (= Geographic Information System), which passes on the positional information to the search device. The use of the GSM network or a similar public wireless telephony system is obvious if the search signal is transmitted by way of the GSM network or a similar network as well.

15 FIG. 2 schematically shows a second exemplary embodiment of a locating system according to the invention. The locating system of FIG. 2 comprises a kind of "pager" network for two-way communication, it being possible to advantageously make partial use of the existing semaphore network, of which an exchange 20 and an antenna 21 are schematically shown. Once again, the exchange is provided with a GIS system 22. In addition, there is required a second network whose antennae 23 are shown.

The shown locating system operates as follows. The parent 1 operates the search device 2 to track a child 4 wearing a responder device 3. The search device then broadcasts a signal 19 which is picked up by one of the antennae 23. Said signals are transmitted to the exchange by way of the second network, as schematically indicated by an arrow 25. Then, said signals are broadcast by the semaphore network and picked up by the responder device 3, as schematically shown by an arrow 24. The responder device is activated by said signals to broadcast a reply signal which is picked up at various points by antennae 23, as symbolised by arrows 26. The antennae 23 transmit said received signals to the exchange by way of connections 27. Based on the signals received and the known location of the receiving antennae 23, the GIS system of the exchange calculates the position of the child, and the positional information obtained in this manner is once again transmitted to the search device by way of the semaphore network, as indicated by an arrow 28. In this system, therefore, the signal transmitted by the responder device may at the

same time serve both for positioning and for possible communication.

It should be noted that the communication between search device and exchange, or between responder device and exchange, respectively, may take place by way of various networks.

5 For completeness' sake, the figures FIG. 3, 4 and 5 schematically show, in the form of block diagrams, three examples of locating systems according to the invention, set up using the GSM network and an earthbound navigational system (FIG. 3), a mobile data network having a GPS system (FIG. 4) and a semaphore network
10 supplemented by a network to be newly installed having earthbound antennae for positioning (FIG. 5).

The system shown in FIG. 3 comprises a position detection system 29 having radio beacons 30, synchronised by a clock 31. The radio beacons may be received both by the search device 1 and by the
15 responder device 3 using receiver sections 32 and 33, respectively. The search device has controls such as buttons 34 and a display screen 35, an energy source such as a battery 36, a GSM transmitter section 37, memory means 38 and 39, a GSM receiver section 40 and a mathematical processor 41 which drives the display screen by way of
20 the memory 39. Furthermore, in this example there is still provided a compass device 42.

The responder device 3 is set up more simply and has a supply source 44, a GSM receiver section 45, a GSM transmitter section 46, a mathematical processor 47 and memory means 48.

25 The exchange 8 receives signals from the GSM transmitter section 37 of the search device 1 and from the GSM transmitter section 46 of the responder device 3. Furthermore, the exchange in operation passes on the signals received. The exchange comprises a code data base 49, in which the various address codes of at least the responder devices
30 are stored. Moreover, the exchange comprises a GIS system 50.

FIG. 4 schematically shows, in the form of a block diagram, a locating system according to the invention which is constructed using a mobile data network and which makes use of the GPS system. For positioning purposes, there are now available GPS satellites 51 which
35 communicate with a GPS receiver 52 in the search device and with a GPS receiver 53 in the responder device. Furthermore, instead of GSM transmitter and receiver sections there are radio transmitter sections 54 and 55 and radio modems 56 and 57 available in the search device

and the responder device.

FIG. 5 schematically shows, in the form of a block diagram, an example of a locating system according to the invention which makes use of a semaphore network and a new network 60 having radio receivers 61 and a network exchange 62 which is, or is not, wirelessly coupled to, or is part of, the exchange 20 of FIG. 2. The radio receivers 61 are coupled to the antennae 23 of FIG. 2. The exchange 20 now contains, in addition to a code data base 49 and a GIS information system 50, yet another network data base 63 for positioning based on signals received from the radio receivers 61 by way of the network exchange 62. The search device 1 and the responder device 3 now each comprise a transmitter section 64, 65 for broadcasting signals to the receivers 61 of the network 60. Furthermore, both devices each comprise a semaphore receiver section 66, 67 for receiving signals which are transmitted by the exchange 20 by way of the semaphore network.

FIG. 6 schematically shows an example of a practical embodiment of a search device 1 for a locating system according to the invention. The device shown has a hand-holdable handle part 70 and a display part 71 provided with a display screen 72, e.g., an LCD screen. The display screen is preferably illuminated, so that it is capable of being read in the dark as well.

Furthermore, at 73, 74 and 75 there are shown control buttons. The buttons serve to switch the device on/off, to select the child to be sought in the event that more children are provided with a responder device. The screen is arranged to show the required information alphanumerically and graphically. This may be, e.g., a street name in combination with a number indicating the distance to the responder device and possibly a directional arrow. It is also basically possible to indicate the route to be followed, e.g., first road to the left, second road to the right, or to display a plan onscreen on which the positions of the search device and the responder device are displayed.

In the handle part 70, the batteries may be accommodated as indicated with dotted lines at 76, and possibly a part of the required electronic circuitry.

The responder device preferably has a shape attractive to the child and is provided with attachment means facilitating a good

fixation, e.g., to the wrist or arm of the child, or around the middle or to the clothing. The responder device preferably has an on/off switch which is placed in such a position that for the child it is difficult to reach. The button may be located, e.g., on the surface
5 of the device resting against the body or the clothing of the child when in use. Furthermore, the device should of course be as resistant as possible to all sorts of environmental influences, shocks and impacts, water etc.

It should be noted that, after the above, various modifications
10 will be obvious to those skilled in the art. Such modifications are deemed to lie within the scope of the following claims.

CLAIMS

1. Mobile locating system, particularly suitable for locating children, characterised by at least one mobile search device (1), at least one mobile responder device (3), a communication network (5;60) which at least permits communication from the search device to the responder device (3) to activate the responder device (3) from the search device (1), and a positioning system (6;29;60) for generating positional signals relating to the position of the responder device (3), and passing on the positional signals to an exchange (8;20) provided with a geographical information system (18;22;50) of the communication network (5;60), which is arranged to transmit positional information obtained from the positional signals to the search device by way of the communication network (5;60).
2. Mobile locating system according to claim 1, characterised in that the positioning system (6;29;60) comprises a network (29) of radio beacons (30), which radio beacons (30) in operation transmit beacon signals which are capable of being received in at least the responder device (3) by a corresponding receiver section (32).
3. Mobile locating system according to claim 1 or 2, characterised in that both the responder device (3) and the search device (1) have a receiver section (32,33;52,53) for positional signals.
4. Mobile locating system according to claim 1,2 or 3, characterised in that the search device (1) and the responder device (3) are connected to the exchange (8;20) by way of an existing public wireless telephony network.
5. Mobile locating system according to claim 1, characterised in that the positioning system (6;29;60) is formed by a public GPS system, the search device (1) and the responder device (3) having corresponding GPS receiver sections (52,53).
6. Mobile locating system according to claim 1, characterised in that the search device (1) and the receiver device (2) in operation are each in connection with the exchange (8;20) by way of a radio

modem (56) and a radio transmitter section (55), respectively.

7. Mobile locating system according to claim 1, characterised in that the positioning system (6;29;60) comprises a network (60) of radio receivers (61), which radio receivers (61) in operation are capable of receiving signals from transmitter sections (64,65) in the search device (1) and/or the responder device (3).

8. Mobile locating system according to claim 1 or 7, characterised in that the search device (1) and the responder device (3), respectively, has a semaphore receiver section (66,67) which in operation is capable of receiving signals from the exchange (8;20).

9. Mobile locating system according to claim 7, characterised in that the exchange (8;20) comprises a network data base (63) having information on the position of the radio receivers (61) for determining the position of a responder device (3).

10. Mobile locating system according to claim 7,8 or 9, characterised in that the network of radio receivers (61) comprises a network exchange (62), which is, or is not, wirelessly coupled to the exchange (8;20), or is part thereof.

11. Mobile locating system according to any of the preceding claims, characterised in that the responder device (3) comprises a mathematical processor (47) which in operation provides output signals to a transmitter section (47;55;65).

12. Mobile locating system according to any of the preceding claims, characterised in that the search device (1) is arranged to directly or indirectly receive positional signals relating to the position of the search device (1) and the position of the responder device (3), and is additionally provided with means to determine, based on said positional signals, in which direction and at which distance from the search device (1) the responder device (3) is.

13. Mobile locating system according to any of the claims 1 to 10 inclusive, characterised in that the exchange (8;20) is arranged to

transmit positional signals relating to the responder device (3) and the search device (1) on the direction and distance of the responder device (3) with respect to the search device (1) to the search device (1), and that the search device (1) is arranged to receive said
5 information and display it using display means (35;72).

14. Mobile locating system according to any of the preceding claims, characterised in that the search device (1) comprises a compass device (43).
10

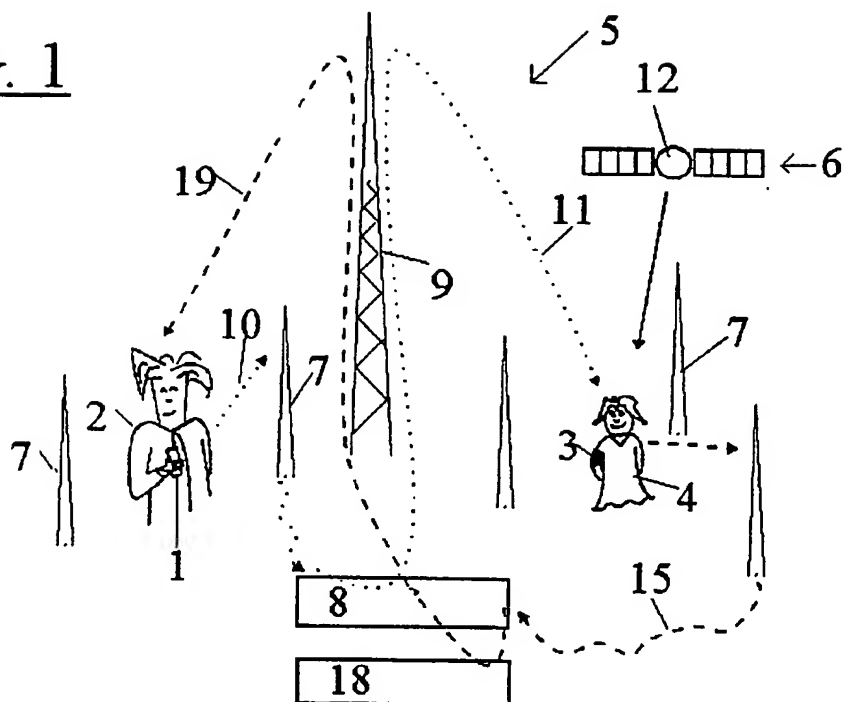
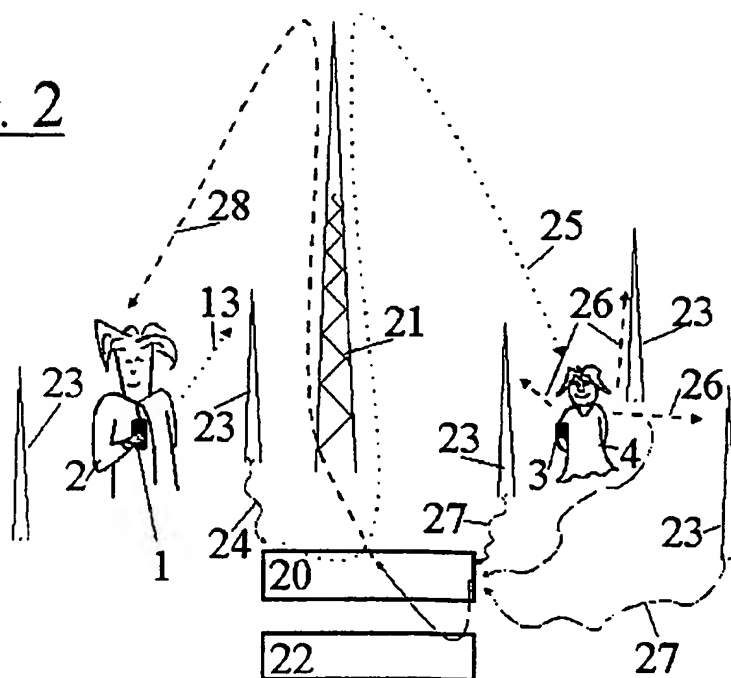
15. Mobile locating system according to any of the preceding claims, characterised in that the search device (1) is provided with a display screen (35;72) and with electronic control circuits (39,41) which are capable of controlling the display screen (35;72) in such a manner
15 that it displays positional information relating to at least the responder device (3).

16. Mobile locating system according to claim 15, characterised in that the positional information comprises graphical and/or
20 alphanumeric information.

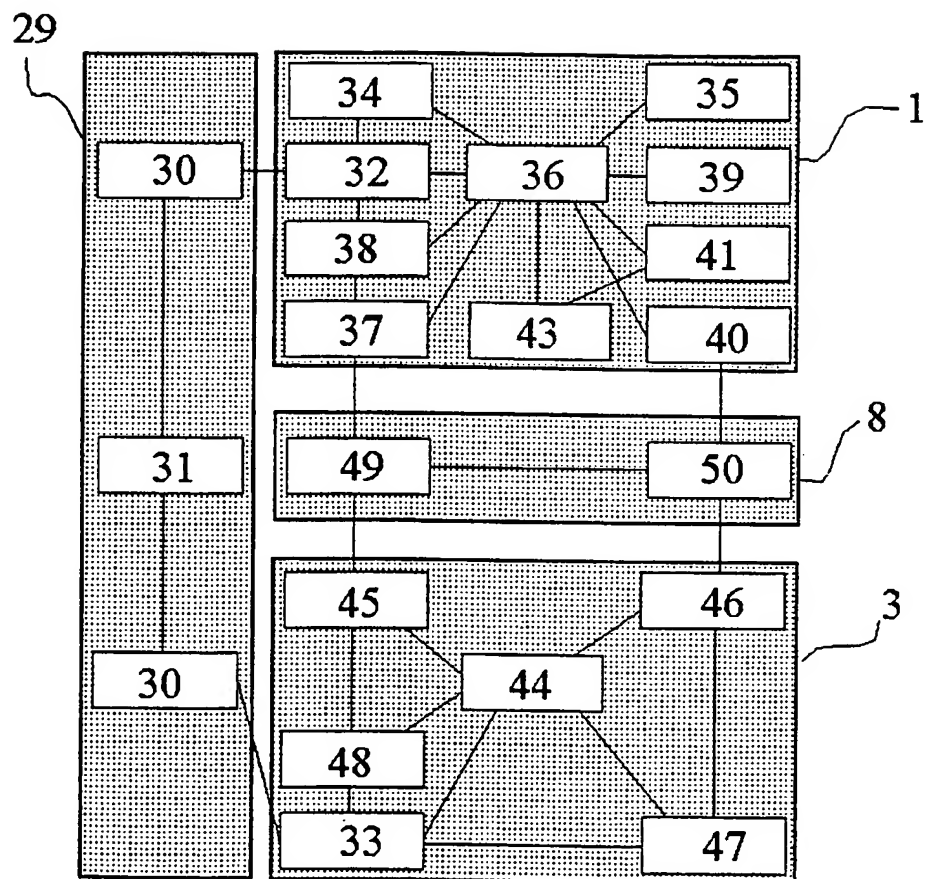
17. Mobile locating system according to claim 15 or 16, characterised in that the positional information comprises a plan.

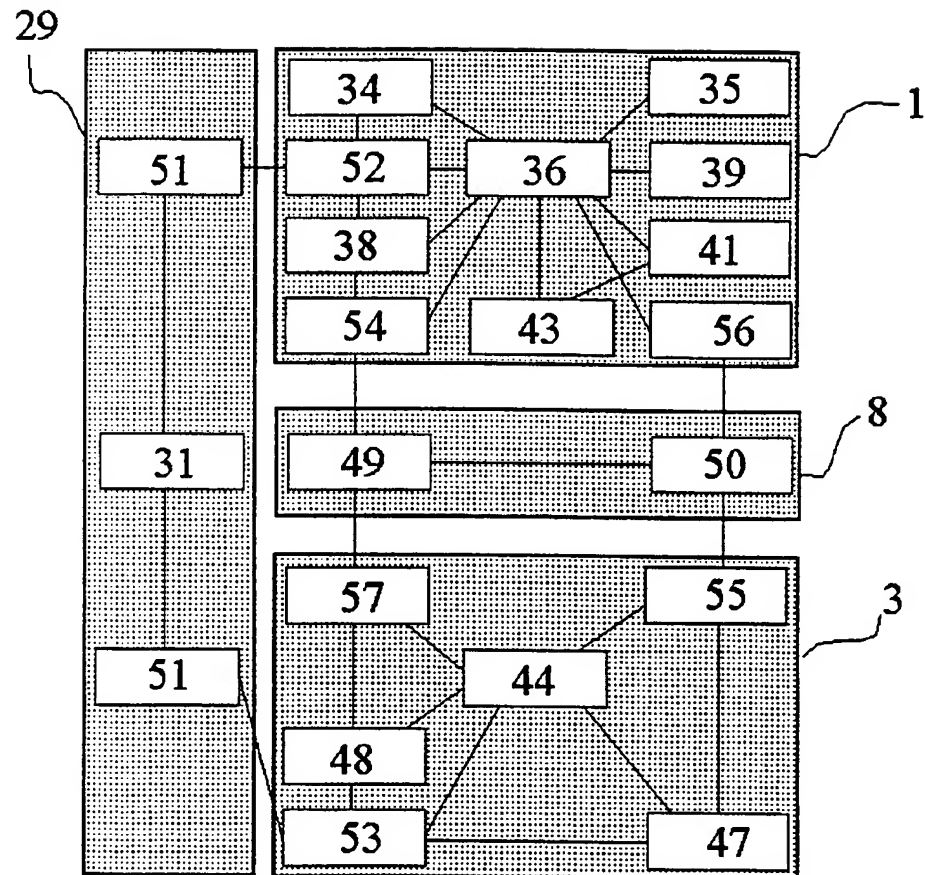
25 18. Mobile locating system according to any of the preceding claims, characterised in that the communication between search device (1) and exchange (8;20), or between responder device (3) and exchange (8;20), respectively, takes place by way of several networks.

1/5

FIG. 1FIG. 2

2/5

FIG. 3

FIG. 4

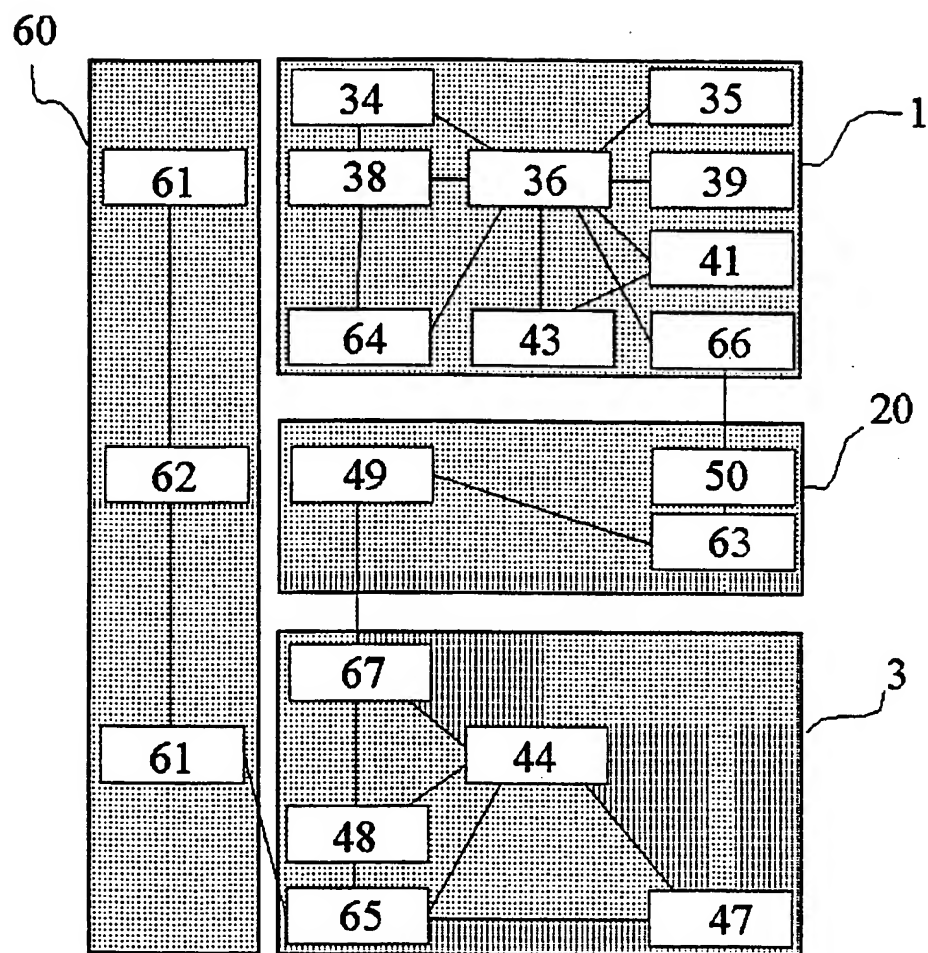
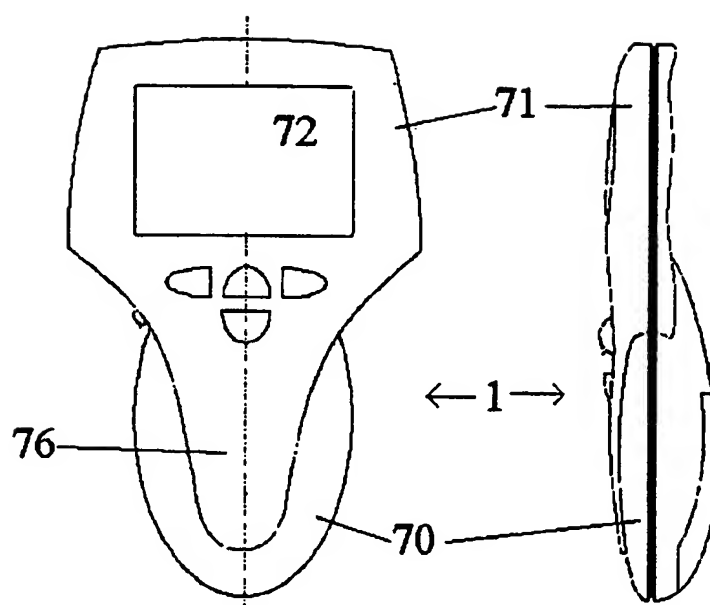


FIG. 5

**FIG. 6**

INTERNATIONAL SEARCH REPORT

national Application No

PCT/IB 99/00713

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 G01S5/14 G01S13/87

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 G01S

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 97 14054 A (SNAPTRACK INC) 17 April 1997 (1997-04-17)	1,2,8, 11,15-18
Y	page 2, paragraph 5 - page 3, paragraph 5 page 8, paragraph 2 - page 9, paragraph 3 page 10, paragraph 2 page 12, paragraph 3 ---	3-7,9, 10,12-14
Y	WO 97 14048 A (AMERICAN TECHNOLOGY CORP) 17 April 1997 (1997-04-17)	3,5,12, 14
A	abstract page 1, line 1 - line 11 page 5, line 26 - page 6, line 14; figures 5,8 --- -/--	11,15,16

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the International search

26 July 1999

Date of mailing of the international search report

03/08/1999

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Roost, J

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IB 99/00713

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	US 5 025 261 A (OHTA TOMOZO ET AL) 18 June 1991 (1991-06-18) abstract column 4, line 18 - line 37 column 6, line 51 - line 59 ----	4,6,13 1-3,5, 11,12, 15-17
Y A	GB 2 316 580 A (IBM) 25 February 1998 (1998-02-25) page 2, line 18 - page 4, line 1 ----	7,9,10 8
P,X	GB 2 322 248 A (FUJITSU LTD) 19 August 1998 (1998-08-19) the whole document ----	1-18
A	US 5 650 770 A (SCHLAGER DAN ET AL) 22 July 1997 (1997-07-22) column 9, line 63 - column 10, line 39 column 14, line 50 - line 58 column 15, line 38 - column 16, line 14 ----	1,2, 15-17
A	WO 96 12264 A (PHILIPS PATENTVERWALTUNG ;PHILIPS ELECTRONICS NV (NL); PHILIPS NOR) 25 April 1996 (1996-04-25) cited in the application abstract ----	1
A	US 5 461 365 A (SCHLAGER DAN ET AL) 24 October 1995 (1995-10-24) cited in the application abstract -----	1

INTERNATIONAL SEARCH REPORT

(information on patent family members)

International Application No

PCT/IB 99/00713

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9714054 A	17-04-1997	AU 1131097 A	30-04-1997
		AU 7396096 A	30-04-1997
		AU 7396596 A	30-04-1997
		AU 7397396 A	30-04-1997
		AU 7397596 A	30-04-1997
		AU 7662096 A	30-04-1997
		CA 2230841 A	17-04-1997
		CN 1199468 A	18-11-1998
		CN 1211324 A	17-03-1999
		EP 0880713 A	02-12-1998
		EP 0855041 A	29-07-1998
		EP 0855039 A	29-07-1998
		WO 9714053 A	17-04-1997
		WO 9714055 A	17-04-1997
		WO 9714049 A	17-04-1997
		WO 9714056 A	17-04-1997
		WO 9714057 A	17-04-1997
WO 9714048 A	17-04-1997	US 5781150 A	14-07-1998
		AU 7438696 A	30-04-1997
		EP 0864104 A	16-09-1998
US 5025261 A	18-06-1991	JP 2189488 A	25-07-1990
		JP 2642979 B	20-08-1997
		JP 2206900 A	16-08-1990
		AU 614893 B	12-09-1991
		AU 4799790 A	26-07-1990
		DE 69021900 D	05-10-1995
		DE 69021900 T	18-04-1996
		EP 0379198 A	25-07-1990
GB 2316580 A	25-02-1998	US 5873040 A	16-02-1999
		JP 10126843 A	15-05-1998
GB 2322248 A	19-08-1998	CN 1190183 A	12-08-1998
		JP 10281801 A	23-10-1998
US 5650770 A	22-07-1997	US 5461365 A	24-10-1995
		AU 697063 B	24-09-1998
		AU 4011595 A	23-05-1996
		BR 9509528 A	30-12-1997
		EP 0850467 A	01-07-1998
		WO 9613819 A	09-05-1996
WO 9612264 A	25-04-1996	EP 0734562 A	02-10-1996
		JP 9508226 T	19-08-1997
US 5461365 A	24-10-1995	AU 697063 B	24-09-1998
		AU 4011595 A	23-05-1996
		BR 9509528 A	30-12-1997
		EP 0850467 A	01-07-1998
		WO 9613819 A	09-05-1996
		US 5650770 A	22-07-1997